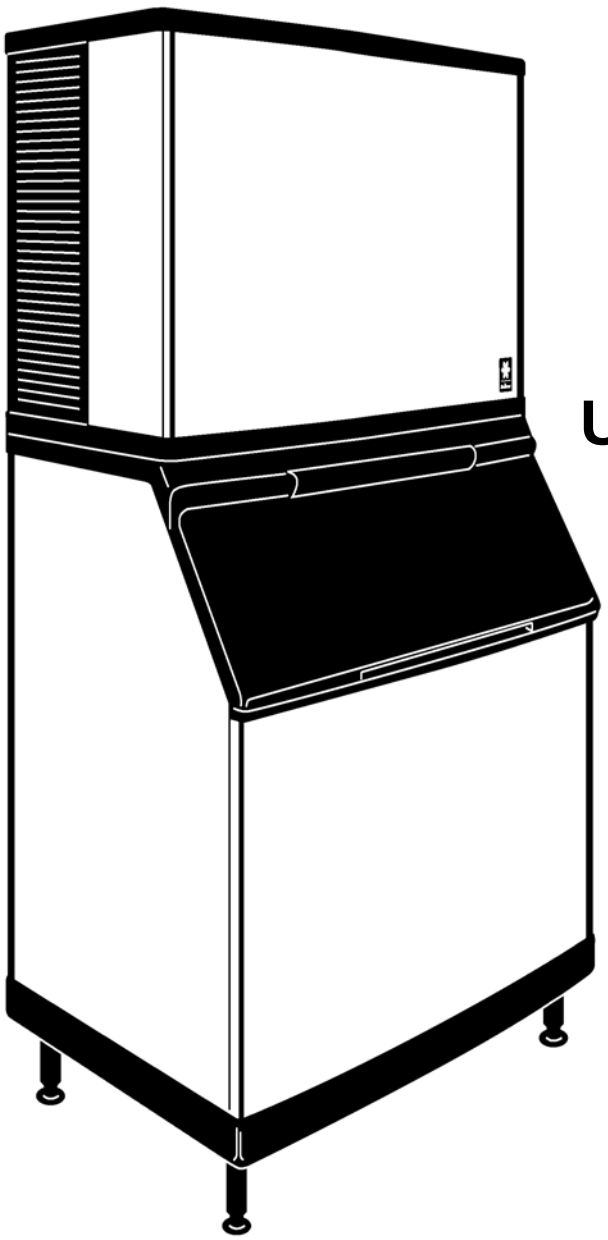
Manitowoc®



Q Model Ice Machines

Installation Use and Care Manual Q460/Q660/Q1060/ Q1090

Thank you for selecting a Manitowoc Ice Machine, the dependability leader in ice making equipment and related products. With proper installation, care and maintenance, your new Manitowoc Ice Machine will provide you with many years of reliable and economical performance.

Part Number 000001759

01/07

Safety Notices

As you work on this Ice Machine, be sure to pay close attention to the safety notices in this manual. Disregarding the notices may lead to serious injury and/or damage to the ice machine.

Throughout this manual, you will see the following types of safety notices:

⚠ Warning
PERSONNEL INJURY POTENTIAL

Do not operate equipment that has been misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

⚠ Warning

Text in a Warning box alerts you to a potential personal injury situation. Be sure to read the Warning statement before proceeding, and work carefully.

⚠ Caution

Text in a Caution box alerts you to a situation in which you could damage the ice machine. Be sure to read the Caution statement before proceeding, and work carefully.

Procedural Notices

As you work on this Ice Machine, be sure to read the procedural notices in this manual. These notices supply helpful information which may assist you as you work.

Throughout this manual, you will see the following types of procedural notices:

Important

Text in an Important box provides you with information that may help you perform a procedure more efficiently. Disregarding this information will not cause damage or injury, but it may slow you down as you work.

NOTE: Text set off as a Note provides you with simple, but useful, extra information about the procedure you are performing.

Read These Before Proceeding:

⚠ Caution

Proper installation, care and maintenance are essential for maximum ice production and trouble-free operation of your Manitowoc Ice Machine.
Read and understand this manual. It contains valuable care and maintenance information. If you enounter problems not covered by this manual, do not proceed, contact Manitowoc Ice, Inc. We will be happy to provide assistance.

Important

Routine adjustments and maintenance procedures outlined in this manual are not covered by the warranty.

We reserve the right to make product improvements at any time.
Specifications and design are subject to change without notice.

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Section 1
General Information

Model Numbers

This manual covers the following models:

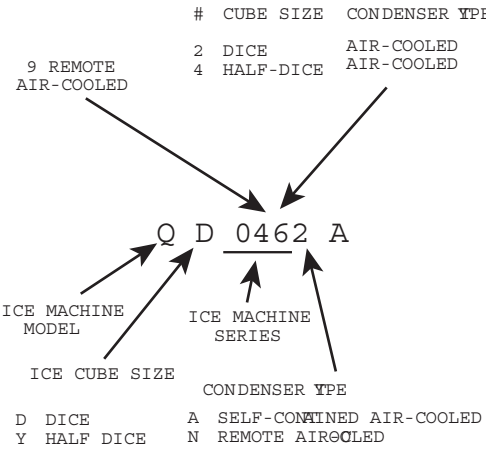
Self-Contained Air-Cooled	Remote
QD0462A QY0464A	N/A
QD0662A QY0664A	N/A
QD1062A QY1064A	QD1069N QY1069N QD1092N QY1092N QR1090N

⚠ Warning

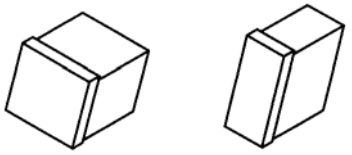
PERSONAL INJURY POTENTIAL

Do not operate equipment that has been misused, abused, neglected, damaged, or altered/modified from that of original manufactured specifications.

How to Read a Model Number



Ice Cube Sizes



Dice
7/8" x 7/8" x 7/8"
2.22 x 2.22 x 2.22 cm

Half Dice
3/8" x 1-1/8" x 7/8"
0.95 x 2.86 x 2.22 cm

Accessories

BIN CASTER

Replaces standard legs.

STACKING KIT

As your business grows and your ice needs increase, Manitowoc stack-on capability can double your daily ice production without using additional floor space.

ICE BAGGER

Maximize profits from bagged ice sales with this convenient accessory. This sturdy unit rests on the bin door frame, and adapts for left or right side filling.

ICE DEFLECTOR

⚠ Warning

All Manitowoc ice machines require the ice storage (bin, dispenser, etc.) to incorporate an ice deflector.

Prior to using a non-Manitowoc ice storage system with Manitowoc ice machines, contact the manufacturer to assure their ice deflector is compatible with Manitowoc ice machines.

GSI200

This accessory releases chlorine dioxide on a controlled basis to inhibit the growth of bacteria and slime.

ARCTIC PURE WATER FILTER SYSTEM

Engineered specifically for Manitowoc ice machines, This water filter is an efficient, dependable, and affordable method of inhibiting scale formation, filtering sediment, and removing chlorine taste and odor.

AUCS® AUTOMATIC CLEANING SYSTEM

This accessory reduces equipment cleaning expense. The AuCS® accessory monitors ice making cycles and initiates cleaning procedures automatically.

DISPENSER

A counter-top dispenser is ideal for cafeterias and many types of self-service facilities. Manitowoc auto-fill, floor-standing ice dispensers meet the strict sanitary requirements of the food service, lodging and health care industries.

MANITOWOC CLEANER AND SANITIZER

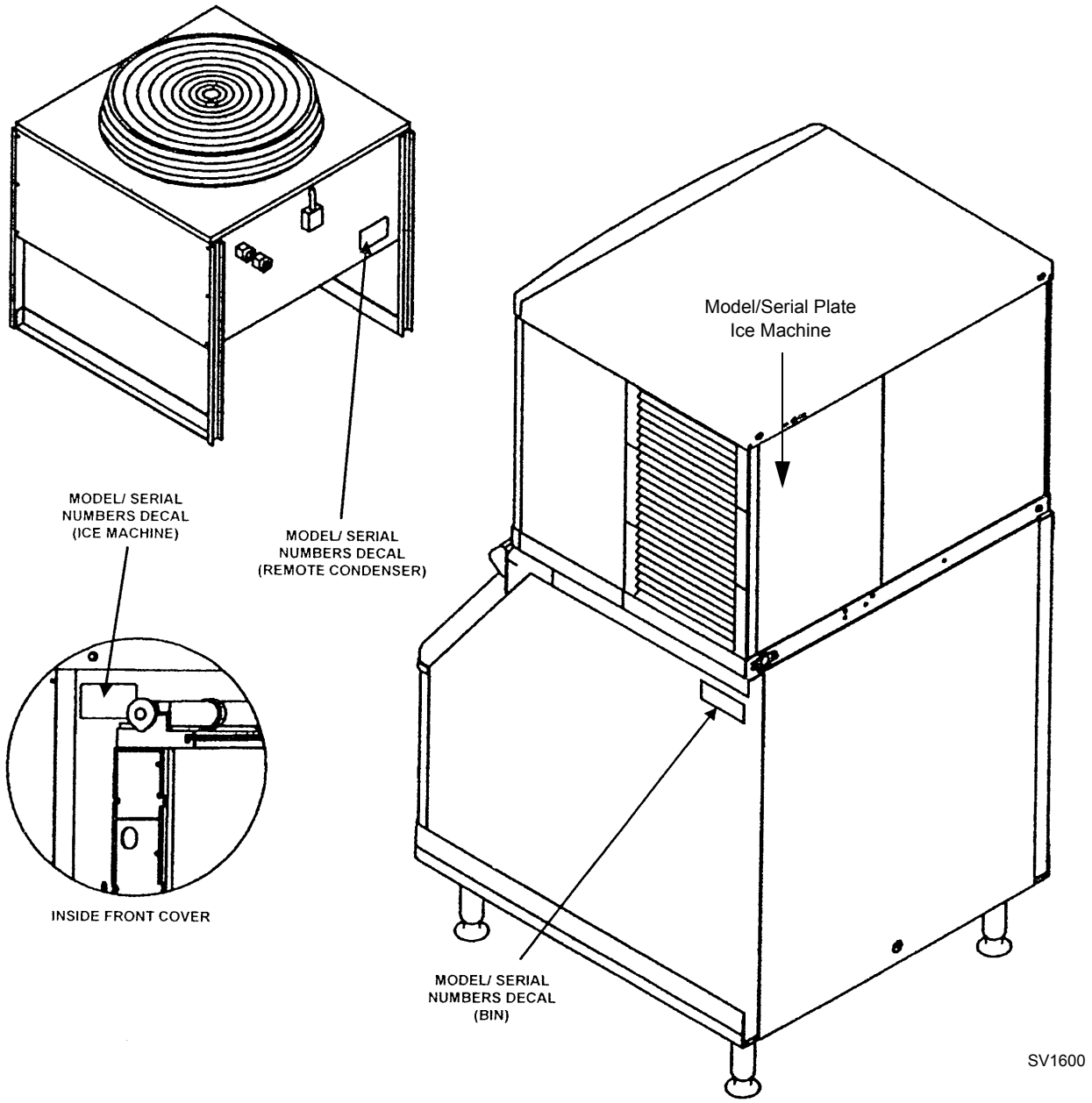
Manitowoc Ice Machine Cleaner and Sanitizer are available in convenient 473 ml and 3.78 l bottles. These are the only cleaner and sanitizer approved for use with Manitowoc products.

Cleaner Part Number		Sanitizer Part Number	
473 ml	94-0456-3	473 ml	94-0565-3
3.78 l	94-0580-3	3.78 l	94-0581-3

Model/Serial Number Location

Record the model and serial number of your ice machine and bin or dispenser in the space provided below. These numbers are required when requesting information from your local Manitowoc distributor, or Manitowoc Ice, Inc.

The model and serial number are listed on the OWNER WARRANTY REGISTRATION CARD. They are also listed on the MODEL/SERIAL NUMBER DECAL affixed to the ice machine, remote condenser and storage bin.


MODEL/ SERIAL NUMBERS DECAL (ICE MACHINE)
MODEL/ SERIAL NUMBERS DECAL (REMOTE CONDENSER)
INSIDE FRONT COVER
Model/Serial Plate Ice Machine
MODEL/ SERIAL NUMBERS DECAL (BIN)
SV1600

Model/Serial Number Location

	Ice Machine	Bin or Dispenser	Remote Condenser	AuCS Accessory
Model Number				
Serial Number				

Warranty

GENERAL

The packet containing this manual also includes warranty information. Warranty coverage begins the day your new ice machine is installed.

Important

Complete and mail the OWNER WARRANTY REGISTRATION CARD as soon as possible to validate the installation date.

If you do not return your OWNER WARRANTY REGISTRATION CARD, Manitowoc will use the date of factory shipping as the first day of warranty coverage for your new ice machine.

Warranty Coverage

GENERAL

The following Warranty outline is provided for your convenience. For a detailed explanation, read the warranty bond shipped with each product.

Contact your local Manitowoc Representative or Manitowoc Ice, Inc. if you need further warranty information.

Important

This product is intended exclusively for commercial application. No warranty is extended for personal, family, or household purposes.

PARTS

1. Manitowoc warrants the ice machine against defects in materials and workmanship, under normal use and service for three (3) years from the date of original installation.
2. The evaporator and compressor are covered by an additional two (2) year (five years total) warranty beginning on the date of the original installation.

LABOR

1. Labor required to repair or replace defective components is covered for three (3) years from the date of original installation.
2. The evaporator is covered by an additional two (2) year (five years total) labor warranty beginning on the date of the original installation.

EXCLUSIONS

The following items are not included in the ice machine's warranty coverage:

1. **Normal maintenance**, adjustments and cleaning.
2. Repairs due to unauthorized modifications to the ice machine or use of non-standard parts without prior written approval from Manitowoc Ice, Inc.
3. Damage caused by improper installation of the ice machine, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.
4. **Premium labor rates** due to holidays, **overtime**, etc.; travel time; flat rate service call charges; mileage and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges resulting from the inaccessibility of equipment are also excluded.
5. Parts or assemblies subjected to misuse, abuse, neglect or accidents.
6. Damage or problems caused by installation, cleaning and/or maintenance procedures inconsistent with the technical instructions provided in this manual.
7. This product is intended exclusively for commercial application. No warranty is extended for personal, family, or household purposes.

AUTHORIZED WARRANTY SERVICE

To comply with the provisions of the warranty, a refrigeration service company qualified and authorized by a Manitowoc distributor, or a Contracted Service Representative must perform the warranty repair.

Normal maintenance, adjustments and cleaning as outlined in this manual are not covered by the warranty. If you have followed the procedures listed on page 5-1 of this manual, and the ice machine still does not perform properly, call your authorized service company.

Section 2
Installation Instructions

General

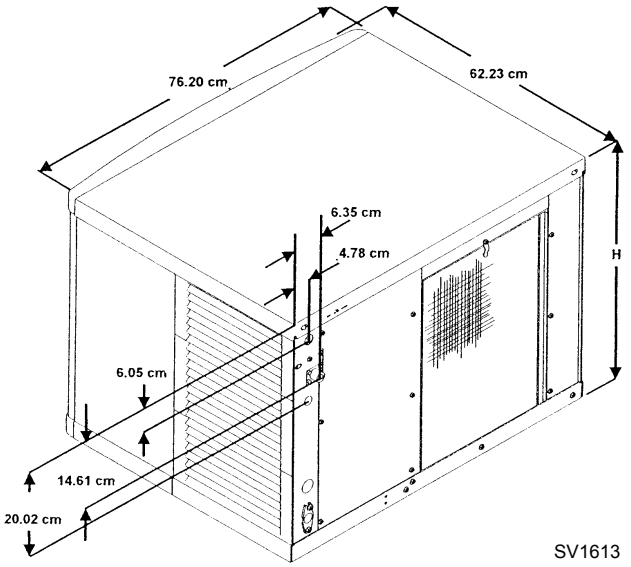
Refer to Installation Manual for complete installation guidelines.

Important

Failure to follow these installation guidelines may affect warranty coverage.

Ice Machine Dimensions

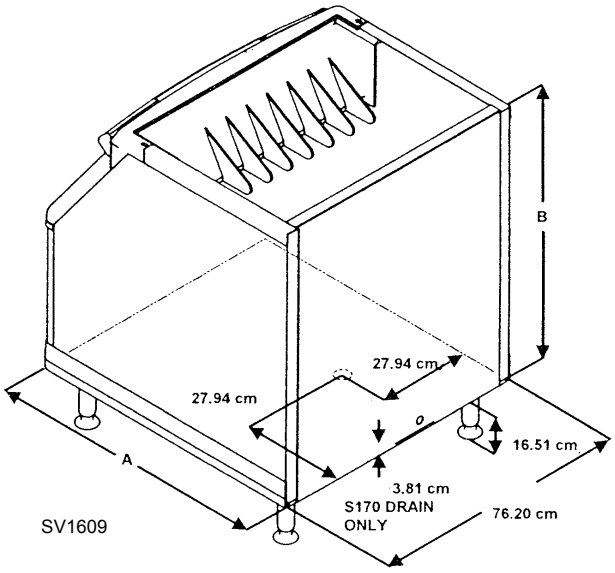
AIR-COOLED



Ice Machine	Dimension H
Q460	54.6 cm
Q660	54.6 cm
Q1060 Q1090	74.9 cm

Ice Storage Bin Dimensions

S170/S400/S570/S970/C570/C950



Bin Model	Dimension A	Dimension B
S170	74.9 cm	48.5 cm
S400	86.3 cm	81.3 cm
S570 C570	86.3 cm	111.7 cm
S970 C970	86.3 cm	111.7 cm

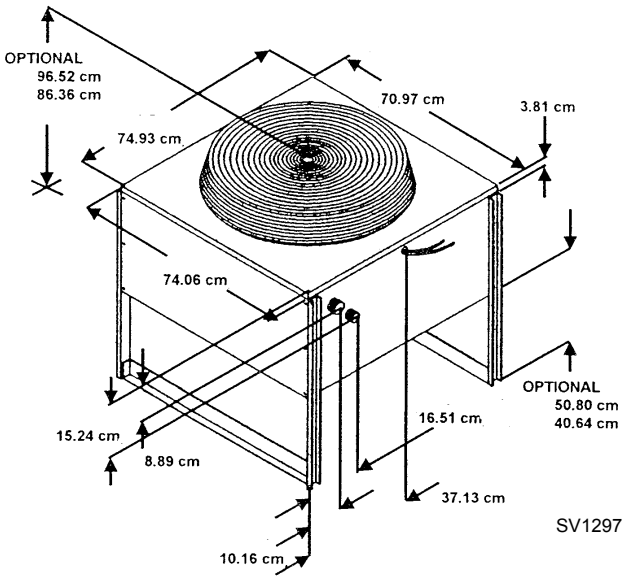
⚠ Warning

All Manitowoc ice machines require the ice storage system (bin, dispenser, etc.) to incorporate an ice deflector.

Prior to using a Manitowoc ice machine on a non-Manitowoc ice storage system, contact the manufacturer to assure their ice deflector is compatible with Manitowoc ice machines.

Remote Condenser Dimensions

JC1096



Location of Ice Machine

The location selected for the ice machine must meet the following criteria. If any of these criteria are not met, select another location.

- The location must be free of airborne and other contaminants.
- The air temperature must be at least 1.6°C, but must not exceed 43.4°C.
- The location must not be near heat-generating equipment or in direct sunlight.
- The location must not obstruct air flow through or around the ice machine. Refer to the chart below for clearance requirements.

Q Models	Self-Contained Air-Cooled	Remote
Top/Sides	203 mm	203 mm
Back	127 mm	127 mm

There is no minimum clearance required. This value is recommended for efficient operation and servicing only.

⚠ Caution

The ice machine must be protected if it will be subjected to temperatures below 0° C. Failure caused by exposure to freezing temperatures is not covered by the warranty. See “Removal from Service/Winterization”.

Stacking Two Ice Machines on a Single Storage Bin

A stacking kit is required for stacking two ice machines. Installation instructions are supplied with the stacking kit.

Q460/Q660/ Q1060	Stacked Self-Contained Air-Cooled	Stacked Remote
Top/Sides	406 mm	127 mm
Back	127 mm	127 mm

Ice Machine Heat of Rejection

Series Ice Machine	Heat of Rejection	
	Air Conditioning	Peak
Q460	7,000	9,600
Q660	9,000	13,900
Q1060	16,000	24,700

B.T.U./Hour
Because the heat of rejection varies during the ice making cycle, the figure shown is an average.

Ice machines, like other refrigeration equipment, reject heat through the condenser. It is helpful to know the amount of heat rejected by the ice machine when sizing air conditioning equipment where self-contained air-cooled ice machines are installed.

This information is also necessary when evaluating the benefits of using water-cooled or remote condensers to reduce air conditioning loads. The amount of heat added to an air conditioned environment by an ice machine using a water-cooled or remote condenser is negligible.

Knowing the amount of heat rejected is also important when sizing a cooling tower for a water-cooled condenser. Use the peak figure for sizing the cooling tower.

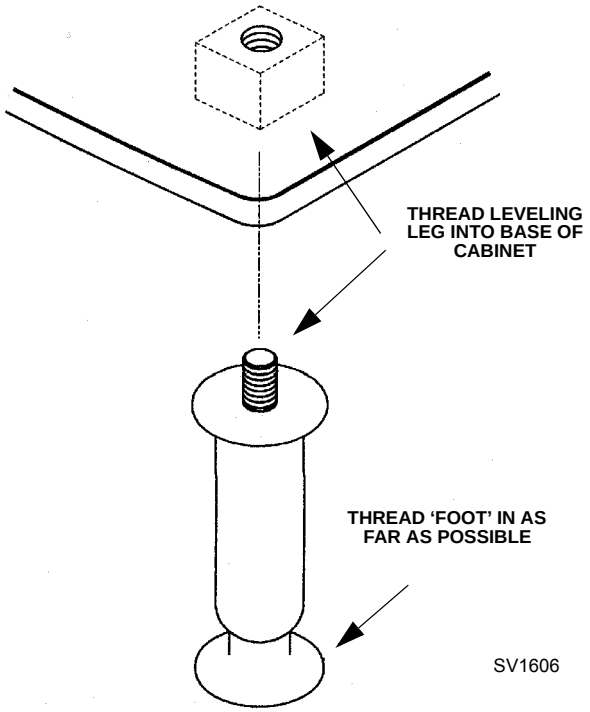
Leveling the Ice Storage Bin

1. Screw the leveling legs onto the bottom of the bin.
2. Screw the foot of each leg in as far as possible.

> **⚠ Caution**
> The legs must be screwed in tightly to prevent them from bending.

3. Move the bin into its final position.
4. Level the bin to assure that the bin door closes and seals properly. Use a level on top of the bin. Turn each foot as necessary to level the bin.

NOTE: An optional caster assembly is available for use in place of the legs. Installation instructions are supplied with the casters.

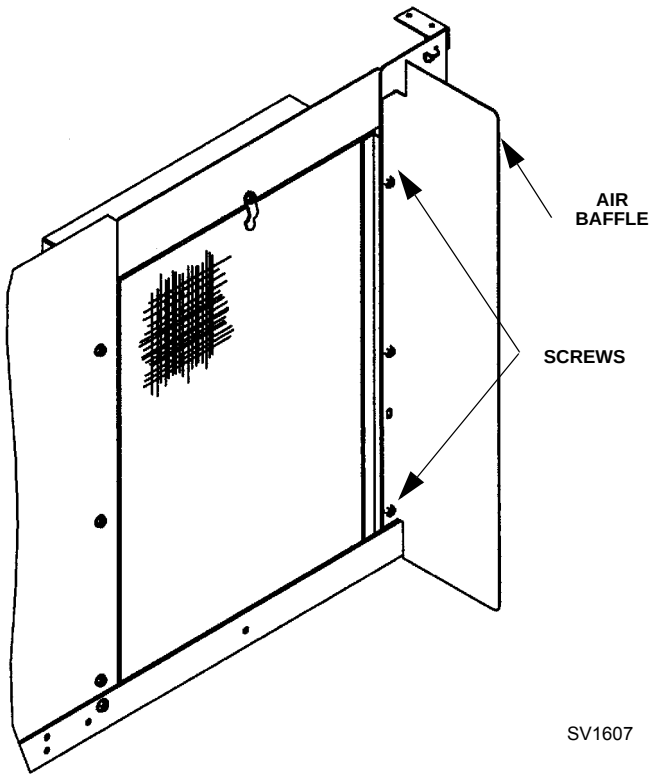


Leveling Leg and Foot

Air-Cooled Baffle

The air-cooled baffle prevents condenser air from recirculating. To install:

1. Remove the back panel screws next to the condenser.
2. Align the mounting holes in the air baffle with the screw holes and reinstall the screws.



Air Baffle

Electrical Service

GENERAL

⚠ Warning
All wiring must conform to local and national codes.

VOLTAGE

The maximum allowable voltage variation is ±10% of the rated voltage at ice machine start-up (when the electrical load is highest).

⚠ Warning
The ice machine must be grounded in accordance with national and local electrical codes.

FUSE/CIRCUIT BREAKER

A separate fuse/circuit breaker must be provided for each ice machine. Circuit breakers must be H.A.C.R. rated.

GROUND FAULT CIRCUIT INTERUPTER

Ground Fault Circuit Interupter (GFCI/GFI) protection is a system that shuts down the electric circuit (opens it) when it senses an unexpected loss of power, presumably to ground. Manitowoc Ice, Inc. does not recommend the use of a GFCI/GFI circuit protection with our equipment. If code requires the use of a GFCI/GFI then you must follow the local code. The circuit must be dedicated, sized properly and there must be a panel GFCI/GFI breaker. We do not recommend GFCI/GFI outlets as they are known for more intermittent nuisance trips than panel breakers.

MINIMUM CIRCUIT AMPACITY

The minimum circuit ampacity is used to help select the wire size of the electrical supply. (Minimum circuit ampacity is not the ice machine's running amp load.)

The wire size (or gauge) is also dependent upon location, materials used, length of run, etc., so it must be determined by a qualified electrician.

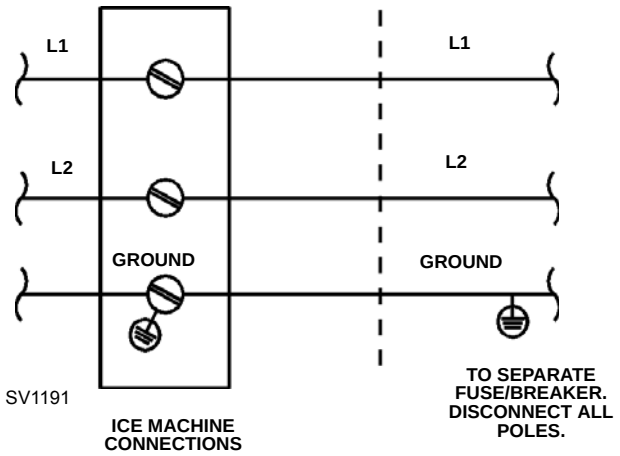
Q460 - Q1090 Ice Machines

Ice Machine	Voltage Phase Cycle	Air-Cooled		Remote	
		Maximum Fuse/ Circuit Breaker	Minimum Circuit Amps	Maximum Fuse/ Circuit Breaker	Minimum Circuit Amps
Q460	230/1/50	15	6.7	N/A	N/A
Q660	230/1/50	15	9.2	N/A	N/A
Q1060	230/1/50	20	15.6	20	14.6
Q1090	230/1/50	N/A	N/A	20	14.6

⚠ Warning

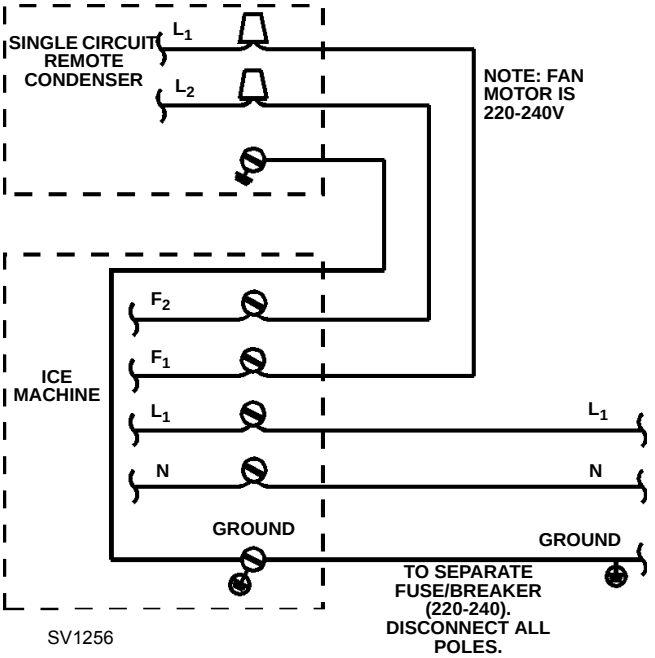
These diagrams are not intended to show proper wire routing, wire sizing, disconnects, etc., only the correct wire connections.All electrical work, including wire routing and grounding, must conform to local and national electrical codes.

SELF CONTAINED ICE MACHINE 230/1/50



Remote Electrical Wiring Connections

REMOTE ICE MACHINE WITH SINGLE CIRCUIT MODEL CONDENSER 230/1/50



Water Supply and Drain Requirements

WATER SUPPLY

Local water conditions may require treatment of the water to inhibit scale formation, filter sediment, and remove chlorine odor and taste.

Important

If you are installing a Manitowoc water filter system, refer to the Installation Instructions supplied with the filter system for ice making water inlet connections.

WATER INLET LINES

Follow these guidelines to install water inlet lines:

- Do not connect the ice machine to a hot water supply. Be sure all hot water restrictors installed for other equipment are working. (Check valves on sink faucets, dishwashers, etc.)
- If water pressure exceeds the maximum recommended pressure, obtain a water pressure regulator from your Manitowoc distributor.
- Install a water shut-off valve for both the ice making and condenser water lines.
- Insulate water inlet lines to prevent condensation.
- Do not apply heat to water inlet valve fitting. This will damage the plastic parts.

DRAIN CONNECTIONS

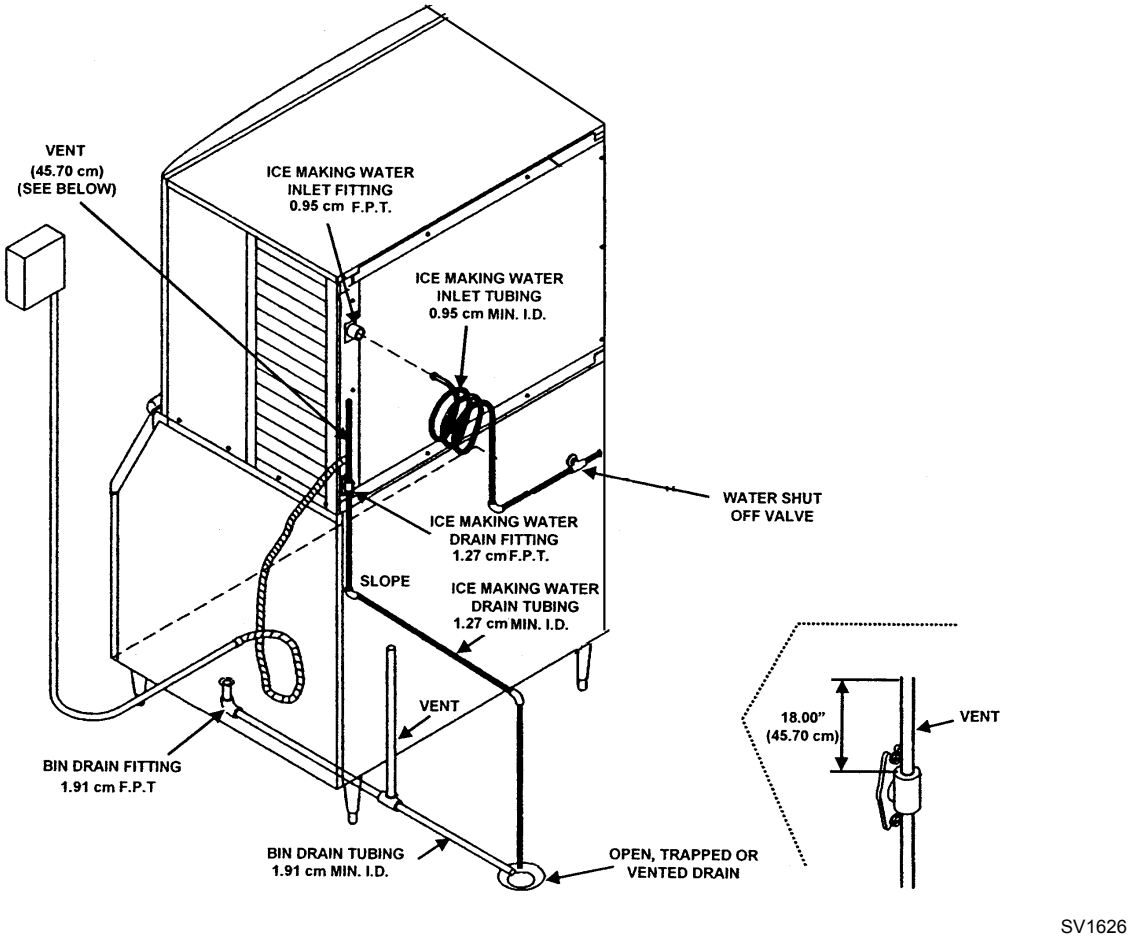
Follow these guidelines when installing drain lines to prevent drain water from flowing back into the ice machine and storage bin:

- Drain lines must have a 2.5 cm drop per meter of run and must not create traps.
- The floor drain must be large enough to accommodate drainage from all drains.
- Run separate bin and ice machine drain lines. Insulate them to prevent condensation.
- Vent the bin and ice machine drain to the atmosphere. Do not vent the condenser drain on water-cooled models.

WATER SUPPLY AND DRAIN LINE SIZING/CONNECTIONS

> **⚠ Caution**
> Plumbing must conform to state and local codes.

Location	Water Temperature	Water Pressure	Ice Machine Fitting	Tubing Size Up to Ice Machine Fitting
Ice Making Water Inlet	0.6°C Min. 32°C Max.	1.38 bar Min. 5.52 bar Max.	3/8" Female Pipe Thread	9.5 mm minimum inside diameter
Ice Making Water Drain	---	---	1/2" Female Pipe Thread	12.7 mm minimum inside diameter
Bin Drain	---	---	3/4" Female Pipe Thread	19 mm minimum inside diameter



Typical Water Supply Drain Installation

Remote Condenser/Line Set Installation

Ice Machine	Remote Single Circuit Condenser	Line Set*
Q1060 Q1090	JC1096	RT-20-R404A RT-35-R404A RT-50-R404A

*Line Set	Discharge Line	Liquid Line
RT	12.7 mm	7.9 mm

Air Temperature Around the Condenser	
Minimum	Maximum
-29°C	49°C

REMOTE ICE MACHINE REFRIGERANT CHARGE

Each remote ice machine ships from the factory with a refrigerant charge appropriate for installation with line sets of up to 30 m. .

⚠ Warning

Potential Personal Injury Situation

The ice machine contains refrigerant charge. Installation of the line sets must be performed by a properly trained and certified refrigeration technician aware of the **dangers of dealing with refrigerant** charged equipment.

Ice Machine	Nameplate Charge (Charge Shipped in Ice Machine)	Refrigerant to be Added for 15 m - 30 m Line Sets	Maximum System Charge (Never Exceed)
Q1090 Q1060	4.4 kg	None	4.4 kg

GENERAL

Condensers must be mounted horizontally with the fan motor on top.

Remote condenser installations consist of vertical and horizontal line sets between the ice machine and the condenser. When combined, they must fit within approved specifications. The following guidelines, drawings and calculation methods must be followed to verify a proper remote condenser installation.

⚠ Caution

The 60 month compressor warranty (including the 36 month labor replacement warranty) will not apply if the remote ice machine is not installed according to specifications.

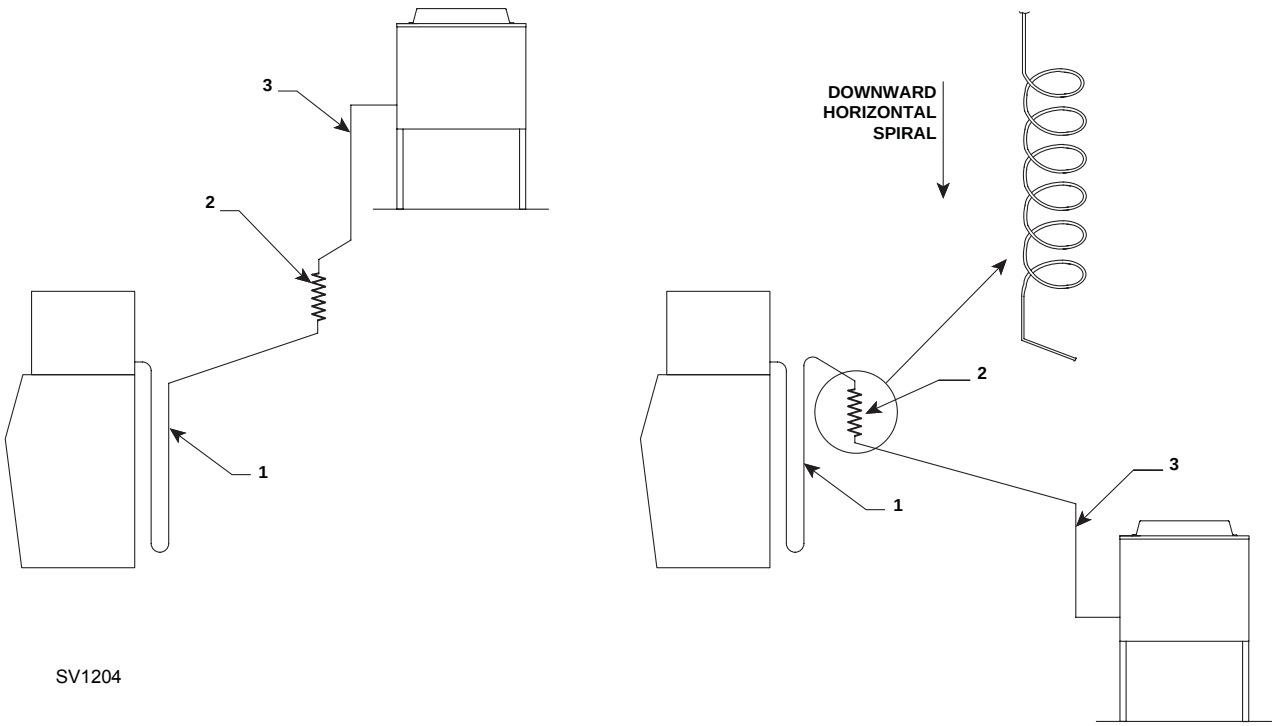
This warranty also will not apply if the refrigeration system is modified with a condenser, heat reclaim device, or other parts or assemblies not manufactured by Manitowoc Ice, Inc., unless specifically approved in writing by Manitowoc Ice, Inc.

GUIDELINES FOR ROUTING LINE SETS

First, cut a 64 mm circular hole in the wall or roof for tubing routing. The line set end with the 90° bend will connect to the ice machine. The straight end will connect to the remote condenser.

Follow these guidelines when routing the refrigerant lines. This will help insure proper performance and service accessibility.

1. Optional - Make the service loop in the line sets (See below). This permits easy access to the ice machine for cleaning and service. Do not use hard rigid copper at this location.
2. Required - Do not form traps in the refrigeration lines (except the service loop). Refrigerant oil must be free to drain toward the ice machine or the condenser. Route excess tubing in a supported downward horizontal spiral (See below). Do not coil tubing vertically.
3. Required - Keep outdoor refrigerant line runs as short as possible.



Routing Line Sets

CALCULATING REMOTE CONDENSER INSTALLATION DISTANCES

Line Set Length

The maximum length is 30 m.

The ice machine compressor must have the proper oil return. The receiver is designed to hold a charge sufficient to operate the ice machine in ambient temperatures between -29°C and 49°C, with line set lengths of up to 30 m.

Line Set Rise/Drop

The maximum rise is 11 m.

The maximum drop is 4.5 m.

> **⚠ Caution**
>
> If a line set has a rise followed by a drop, another rise cannot be made. Likewise, if a line set has a drop followed by a rise, another drop cannot be made.

Calculated Line Set Distance

The maximum distance is 45 m.

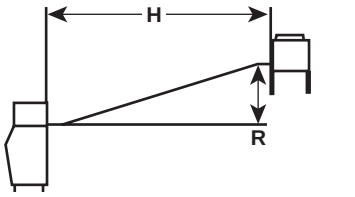
Line set rises, drops, horizontal runs (or combinations of these) in excess of the stated maximums will exceed compressor start-up and design limits. This will cause poor oil return to the compressor.

Make the following calculations to make sure the line set layout is within specifications.

1. Insert the **measured rise** into the formula below. Multiply by 1.7 to get the **calculated rise.** (Example: A condenser located 3 meters above the ice machine has a **calculated rise** of 5 meters.
2. Insert the **measured drop** into the formula below. Multiply by 6.6 to get the **calculated drop.** (Example. A condenser located 3 meters below the ice machine has a **calculated drop** of 20 meters.
3. Insert the **measured horizontal distance** into the formula below. No calculation is necessary.
4. Add together the **calculated rise, calculated drop,** and **horizontal distance** to get the **total calculated distance.** If this total exceeds 45 m, move the condenser to a new location and perform the calculations again.

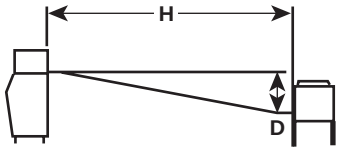
Maximum Line Set Distance Formula

Step 1.	Measured Rise 10.7 m Maximum	_____ x 1.7	=	_____	Calculated Rise
Step 2.	Measured Drop 4.5 m Maximum	_____ x 6.6	=	_____	Calculated Drop
Step 3.	Measured Horizontal Distance 30.5 m Maximum			_____	Horizontal Distance
Step 4.	Total Calculated Distance 45 m Maximum			_____	Total Calculated Distance



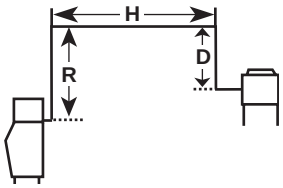
SV1196

Combination of a Rise and a Horizontal Run



SV1195

Combination of a Drop and a Horizontal Run



SV1194

Combination of a Rise, a Drop and a Horizontal Run

LENGTHENING OR REDUCING LINE SET LENGTHS

In most cases, by routing the line set properly, shortening will not be necessary. When shortening or lengthening is required, do so before connecting the line set to the ice machine or the remote condenser. This prevents the loss of refrigerant in the ice machine or condenser.

The quick connect fittings on the line sets are equipped with Schraeder valves. Use these valves to recover any vapor charge from the line set. When lengthening or shortening lines, follow good refrigeration practices and insulate new tubing. Do not change the tube sizes. Evacuate the lines and place about 143g of vapor refrigerant charge in each line.

CONNECTING A LINE SET

1. Remove the dust caps from the line set, condenser and ice machine.
2. Apply refrigeration oil to the threads on the quick disconnect couplers before connecting them to the condenser.
3. Carefully thread the female fitting to the condenser or ice machine by hand.
4. Tighten the couplings with a wrench until they bottom out.
5. Turn an additional 1/4 turn to ensure proper brass-to-brass seating. Torque to the following specifications:

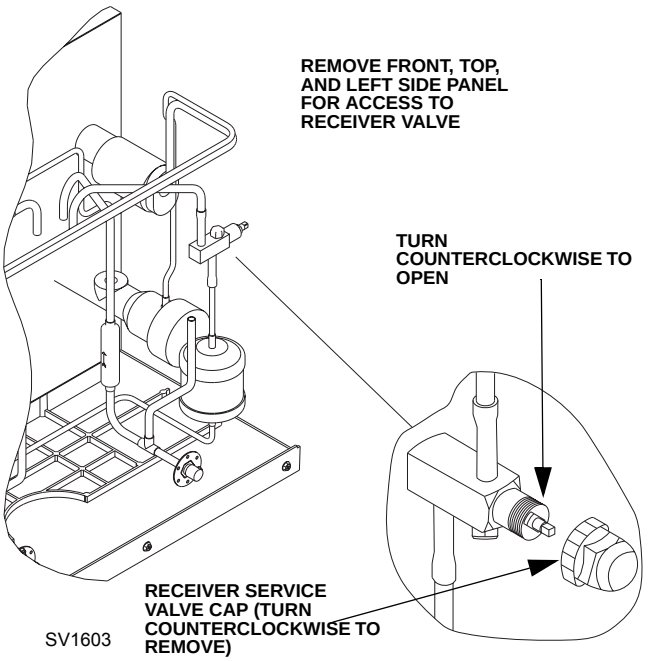
Liquid Line	Discharge Line
13.5-16.2 N•m	47.5-61.0 N•m

6. Check all fittings for leaks.

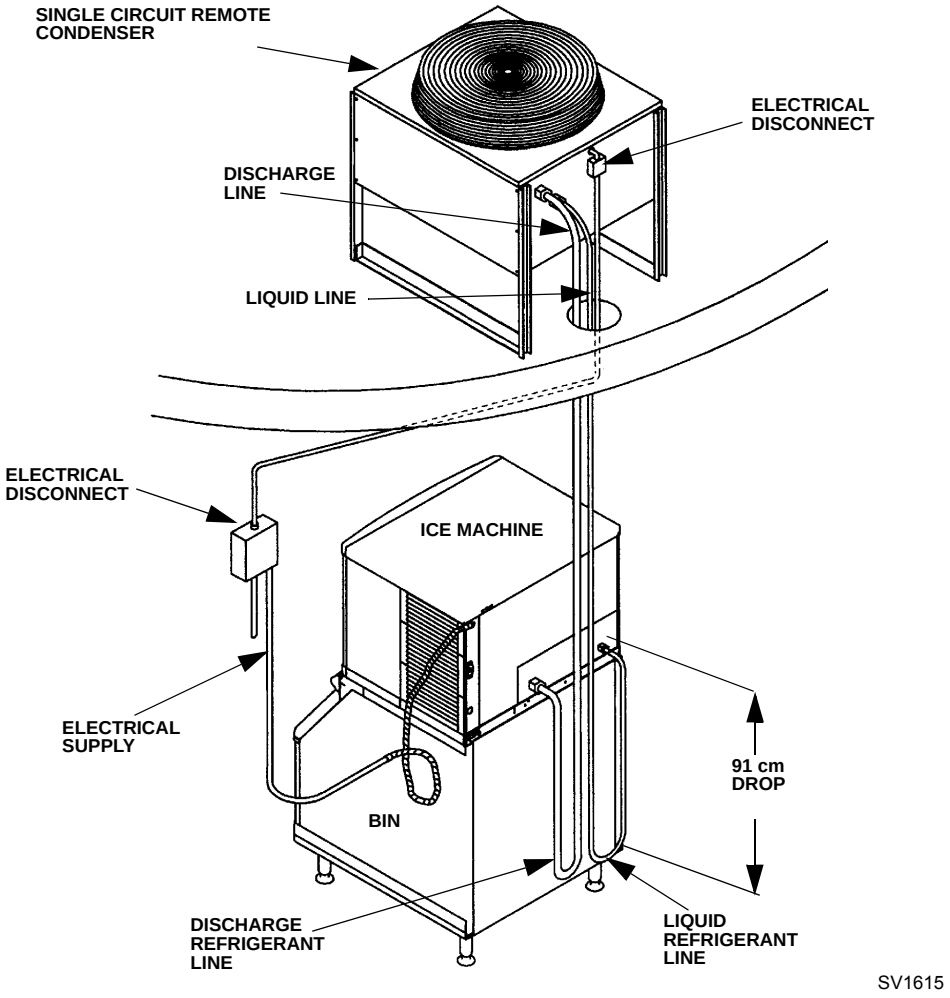
REMOTE RECEIVER SERVICE VALVE

The receiver service valve is closed during shipment. Open the valve prior to starting the ice machine.

1. Remove the top and left side panels.
2. Remove the receiver service valve cap.
3. Backseat (open) the valve.
4. Reinstall the cap and panels.


REMOVE FRONT, TOP, AND LEFT SIDE PANEL FOR ACCESS TO RECEIVER VALVE
TURN COUNTERCLOCKWISE TO OPEN
RECEIVER SERVICE VALVE CAP (TURN COUNTERCLOCKWISE TO REMOVE)
SV1603

Backseating the Receiver Service Valve



Typical Single Circuit Remote Condenser Installation

Installation Check List

Is the Ice Machine level?

Has all of the internal packing been removed?

Have all of the electrical and water connections been made?

Has the supply voltage been tested and checked against the rating on the nameplate?

Is there proper clearance around the ice machine for air circulation?

Has the ice machine been installed where ambient temperatures will remain in the range of 1.7° - 43°C?

Has the ice machine been installed where the incoming water temperature will remain in the range of 0.6° - 32°C?

Is the water trough drain plug installed?

Are the ice machine and bin drains vented?

Are all electrical leads free from contact with refrigeration lines and moving equipment?

Has the owner/operator been instructed regarding maintenance and the use of Manitowoc Cleaner and Sanitizer?

Has the owner/operator completed the warranty registration card?

Has the ice machine and bin been sanitized?

Is the toggle switch set to ice? (The toggle switch is located directly behind the front panel).

Is the ice thickness control set correctly? (Refer to Operational Checks in Section 3 of this manual to check/set the correct ice bridge thickness).

Additional Checks for Remote Models

Has the receiver service valve been opened 100%?

Does the remote condenser fan operate properly after start-up?

Has the remote condenser been located where ambient temperatures will remain in the range of -6.6 - 49°C?

Is the line set routed properly?

Section 3
Ice Machine Operation

Component Identification

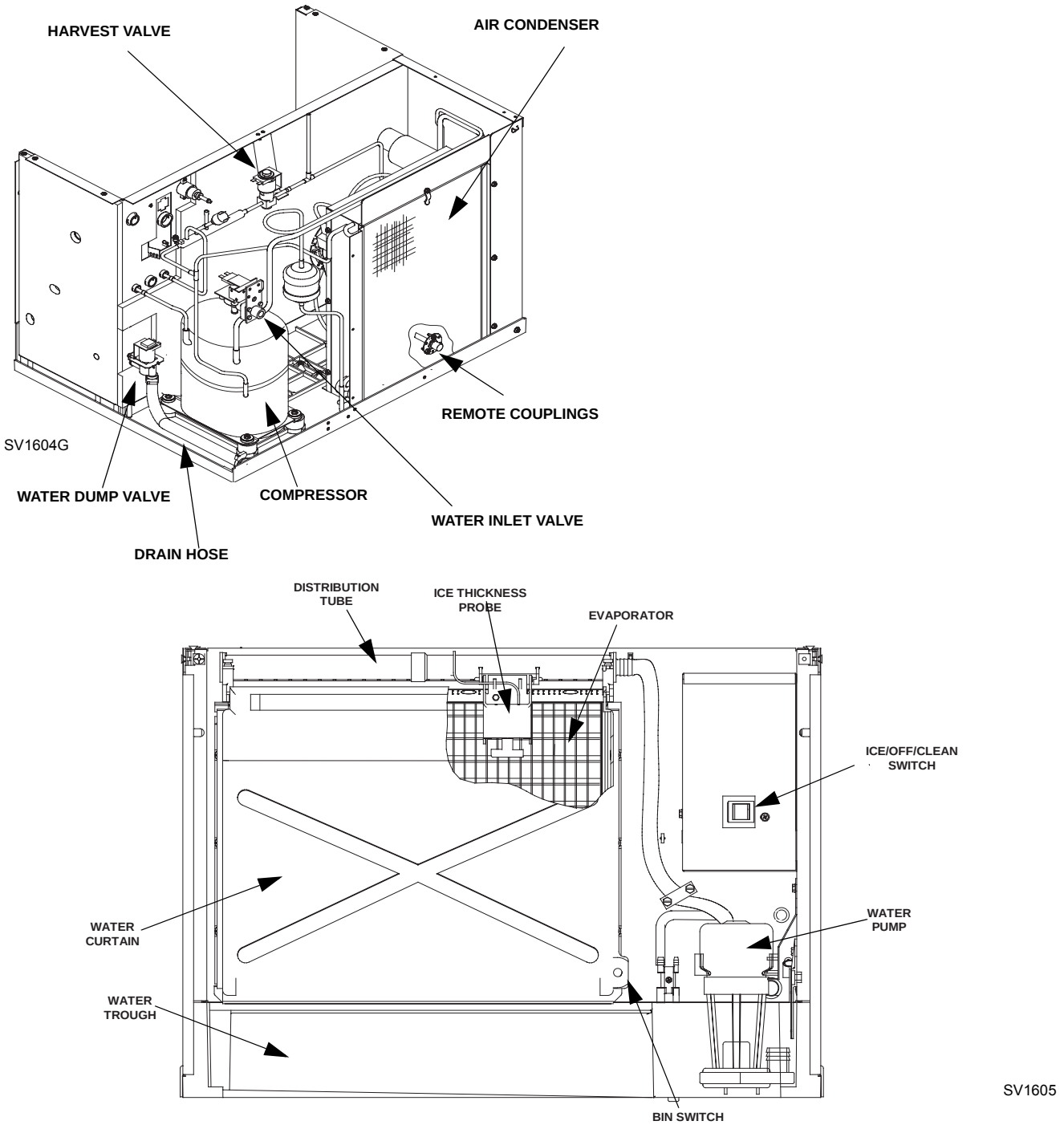


Figure 3-1. Component Identification (Typical Q460 Shown)

Self-Contained Air-Cooled Q460/Q660/Q1060

INITIAL START-UP OR START-UP AFTER AUTOMATIC SHUT-OFF

1. Water Purge

Before the compressor starts, the water pump and water dump solenoid are energized for 45 seconds, to completely purge the ice machine of old water. This feature ensures that the ice making cycle starts with fresh water.

The harvest valve is also energized during water purge, although it stays on for an additional 5 seconds (50 seconds total on time) during the initial refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor starts after the 45 second water purge, and it remains on throughout the entire Freeze and Harvest Sequences. The water fill valve is energized at the same time as the compressor. It remains on until the water level sensor closes for 3 continuous seconds, or until a six-minute time period has expired. The harvest valve remains on for 5 seconds during initial compressor start-up and then shuts off.

At the same time the compressor starts, the condenser fan motor (air-cooled models) is supplied with power throughout the entire Freeze and Harvest Sequences. The fan motor is wired through a fan cycle pressure control, therefore it may cycle on and off. (The compressor and condenser fan motor are wired through the contactor. As a result, anytime the contactor coil is energized, the compressor and fan motor are supplied with power.)

FREEZE SEQUENCE

3. Prechill

The compressor is on for 30 seconds prior to water flow, to prechill the evaporator.

4. Freeze

The water pump restarts after the 30 second prechill. An even flow of water is directed across the evaporator and into each cube cell, where it freezes. The water fill valve will cycle on and then off one more time to refill the water trough.

When sufficient ice has formed, the water flow (not the ice) contacts the ice thickness probe. After approximately 7 seconds of continual water contact, the harvest sequence is initiated. The ice machine cannot initiate a harvest sequence until a 6 minute freeze lock has been surpassed.

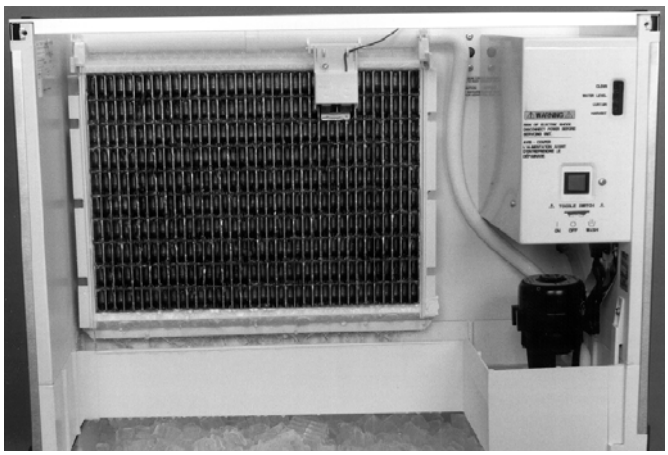


Figure 3-2. Freeze Sequence (Typical Q460 Shown)

HARVEST SEQUENCE

5. Water Purge

The water pump continues to run, and the water dump valve energizes for 45 seconds to purge the water in the sump trough. The water fill valve energizes (turns on) and de-energizes (turns off) strictly by time. The water fill valve energizes for the last 15 seconds of the 45-second water purge. The water purge must be at the factory setting of 45 seconds for the fill valve to energize during the last 15 seconds of the Water Purge. If set at less than 45 seconds the water fill valve does not energize during the water purge.

After the 45 second water purge, the water fill valve, water pump and dump valve de-energize. The harvest valve also opens at the beginning of the water purge to divert hot refrigerant gas into the evaporator.

6. Harvest

The harvest valve remains open and the refrigerant gas warms the evaporator causing the cubes to slide, as a sheet, off the evaporator and into the storage bin. The sliding sheet of cubes swings the water curtain out, opening the bin switch. The momentary opening and re-closing of the bin switch terminates the harvest sequence and returns the ice machine to the freeze sequence (Step 3 - 4.)

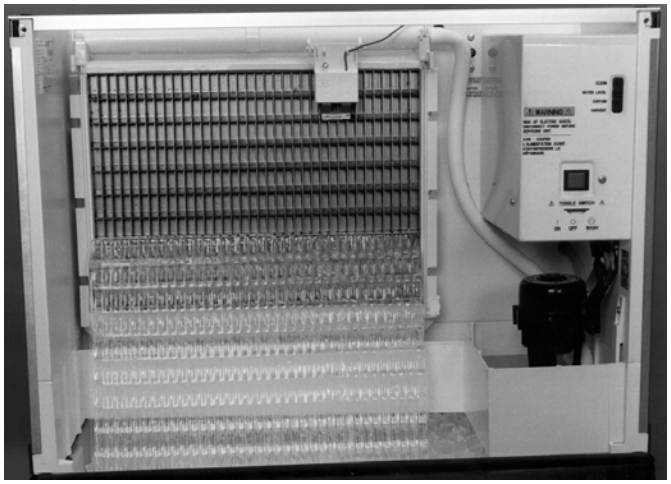


Figure 3-3. Harvest Sequence (Typical Q460 Shown)

AUTOMATIC SHUT-OFF

7. Automatic Shut-Off

When the storage bin is full at the end of a harvest sequence, the sheet of cubes fails to clear the water curtain and will hold it open. After the water curtain is held open for 7 seconds, the ice machine shuts off. The ice machine remains off for 3 minutes before it can automatically restart.

The ice machine remains off until enough ice has been removed from the storage bin to allow the ice to fall clear of the water curtain. As the water curtain swings back to the operating position, the bin switch re-closes and the ice machine restarts (steps 1 - 2), provided the 3 minute delay period is complete.

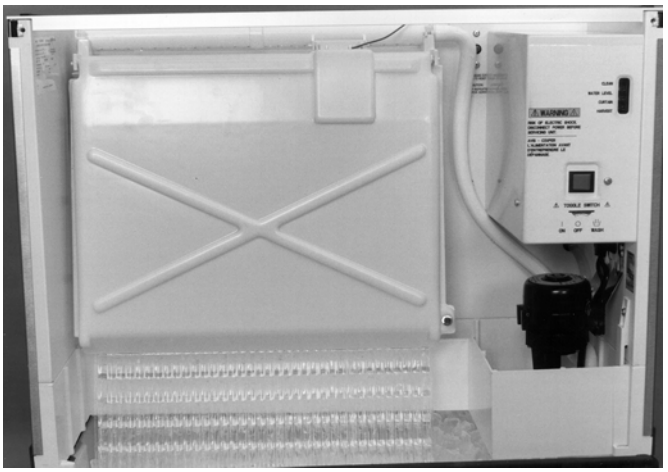


Figure 3-4. Automatic Shut-Off (Typical Q460 Shown)

Remote
Q1060/Q1090

INITIAL START-UP OR START-UP AFTER AUTOMATIC SHUT-OFF

1. Water Purge

Before the compressor starts, the water pump and water dump solenoid are energized for 45 seconds, to completely purge the ice machine of old water. This feature ensures that the ice making cycle starts with fresh water.

The harvest valve and harvest pressure regulating (HPR) solenoid valves also energize during water purge, although they stay on for an additional 5 seconds (50 seconds total on time) during the initial refrigeration system start-up.

2. Refrigeration System Start-Up

The compressor and liquid line solenoid valve energize after the 45 second water purge and remain on throughout the entire Freeze and Harvest Sequences. The water fill valve is energized at the same time as the compressor. It remains on until the water level sensor closes for 3 continuous seconds, or until a six-minute time period has expired. The harvest valve and HPR solenoid valves remain on for 5 seconds during initial compressor start-up and then shut off.

The remote condenser fan motor starts at the same time the compressor starts and remains on throughout the entire Freeze and Harvest Sequences. (The compressor and condenser fan motor are wired through the contactor, therefore, anytime the contactor coil is energized, the compressor and fan motor are on.)

FREEZE SEQUENCE

3. Prechill

The compressor is on for 30 seconds prior to water flow, to prechill the evaporator.

4. Freeze

The water pump restarts after the 30 second prechill. An even flow of water is directed across the evaporator and into each cube cell, where it freezes. The water fill valve will cycle on and then off one more time to refill the water trough.

When sufficient ice has formed, the water flow (not the ice) contacts the ice thickness probe. After approximately 7 seconds of continual water contact, the harvest sequence is initiated. The ice machine cannot initiate a harvest sequence until a 6 minute freeze lock has been surpassed.

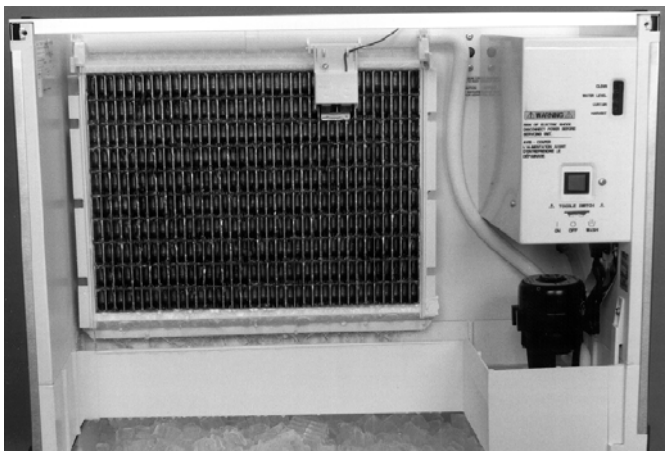


Figure 3-5. Freeze Sequence (Typical Q460 Shown)

HARVEST SEQUENCE

5. Water Purge

The water pump continues to run, and the water dump valve energizes for 45 seconds to purge the water in the sump trough. The water fill valve energizes (turns on) and de-energizes (turns off) strictly by time. The water fill valve energizes for the last 15 seconds of the 45-second water purge. The water purge must be at the factory setting of 45 seconds for the fill valve to energize during the last 15 seconds of the Water Purge. If set at less than 45 seconds the water fill valve does not energize during the water purge.

After the 45 second water purge, the water fill valve, water pump and dump valve de-energize. The harvest valve and HPR solenoid valve also open at the beginning of the water purge.

6. Harvest

The HPR valve and the harvest valve remain open and the refrigerant gas warms the evaporator causing the cubes to slide, as a sheet, off the evaporator and into the storage bin. The sliding sheet of cubes swings the water curtain out, opening the bin switch. The momentary opening and re-closing of the bin switch terminates the harvest sequence and returns the ice machine to the freeze sequence (Step 3 - 4.)

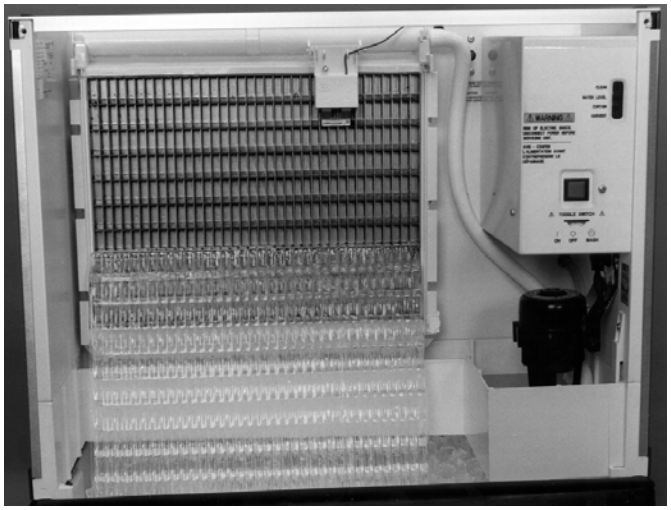


Figure 3-6. Harvest Sequence (Typical Q460 Shown)

AUTOMATIC SHUT-OFF

7. Automatic Shut-Off

When the storage bin is full at the end of a harvest sequence, the sheet of cubes fails to clear the water curtain and will hold it open. After the water curtain is held open for 7 seconds, the ice machine shuts off. The ice machine remains off for 3 minutes before it can automatically restart.

The ice machine remains off until enough ice has been removed from the storage bin to allow the ice to drop clear of the water curtain. As the water curtain swings back to the operating position, the bin switch re-closes and the ice machine restarts (steps 1 - 2) provided the 3 minute delay period is complete.

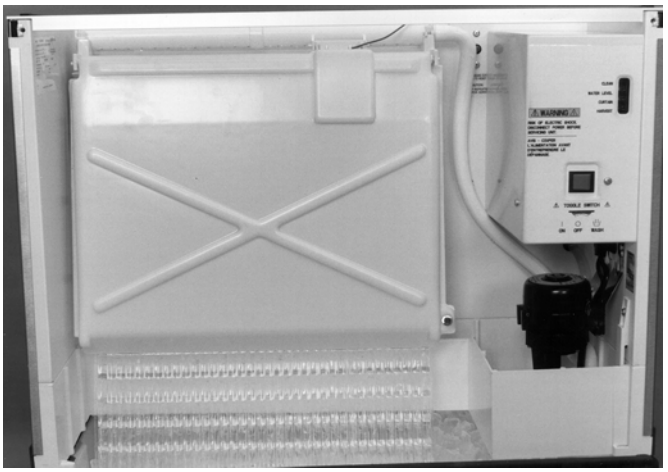


Figure 3-7. Automatic Shut-Off (Typical Q460 Shown)

Operational Checks

GENERAL

Manitowoc ice machines are factory-operated and adjusted before shipment. Normally, new installations do not require any adjustment.

To ensure proper operation, always follow the Operational Checks:

- when starting the ice machine for the first time
- after a prolonged out of service period
- after cleaning and sanitizing

NOTE: Routine adjustments and maintenance procedures are not covered by the warranty.

WATER LEVEL

The water level sensor is set to maintain the proper water level above the water pump housing. The water level is not adjustable.

If the water level is incorrect, check the water level probe for damage (probe bent, etc.). Repair or replace the probe as necessary.

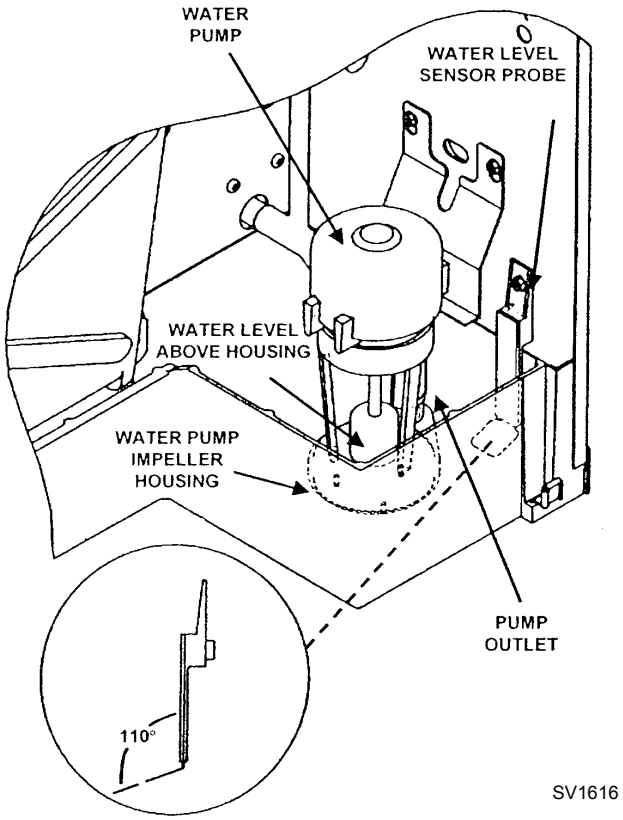


Figure 3-8. Water Level Probe

ICE THICKNESS CHECK

The ice thickness probe is factory-set to maintain the ice bridge thickness at 3 mm.

NOTE: Make sure the water curtain is in place when performing this check. It prevents water from splashing out of the water trough.

1. Inspect the bridge connecting the cubes. It should be about 3 mm thick.
2. If adjustment is necessary, turn the ice thickness probe adjustment screw clockwise to increase bridge thickness, counterclockwise to decrease bridge thickness.

NOTE: Turning the adjustment 1/3 of a turn will change the ice thickness about 1.5 mm.

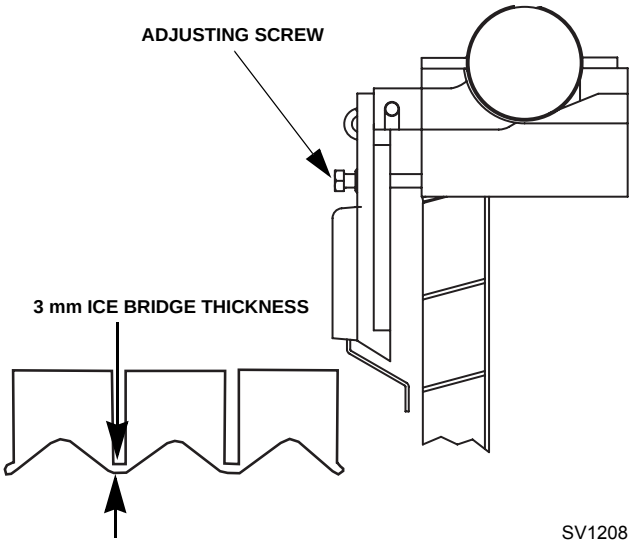


Figure 3-9. Ice Thickness Check

3. Make sure the ice thickness probe wire and the bracket do not restrict movement of the probe.

HARVEST SEQUENCE WATER PURGE

The harvest sequence water purge adjustment may be used when the ice machine is hooked up to special water systems, such as a de-ionized water treatment system.

Important

The harvest sequence water purge is factory-set at 45 seconds. A shorter purge setting (with standard water supplies such as city water) is not recommended. This can increase water system cleaning and sanitizing requirements.

- The harvest sequence water purge may be set to 15, 30, or 45 seconds.
- During the harvest sequence water purge, the water fill valve energizes and de-energizes by time. The water purge must be at the factory setting of 45 seconds for the water fill valve to energize during the last 15 seconds of the water purge. If it is set to less than 45 seconds, the water fill valve will not energize during the water purge.

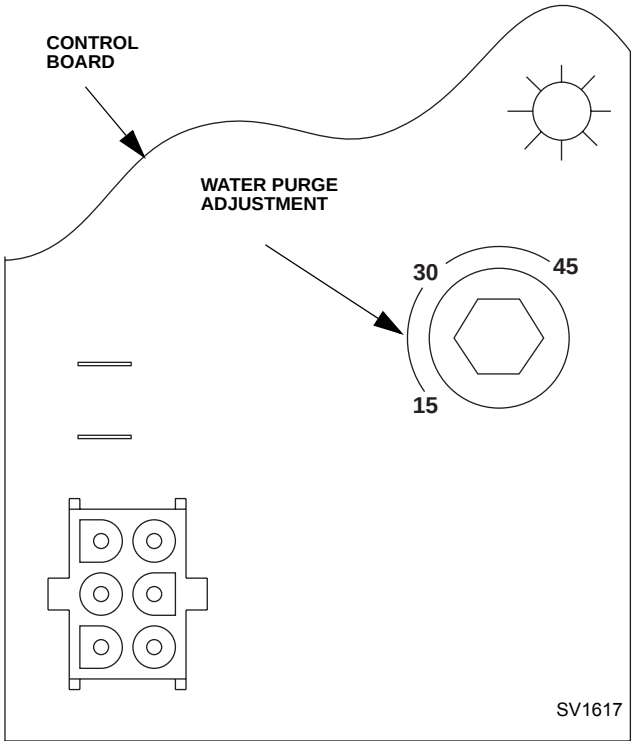


Figure 3-10. Water Purge Adjustment

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Section 4
Maintenance

Interior Cleaning and Sanitizing

GENERAL

Clean and sanitize the ice machine every six months for efficient operation. If the ice machine requires more frequent cleaning and sanitizing, consult a qualified service company to test the water quality and recommend appropriate water treatment. The ice machine must be taken apart for cleaning and sanitizing.

> **⚠ Caution**
> Use only Manitowoc approved Ice Machine Cleaner and Sanitizer for this application (Manitowoc Cleaner part number 94-0546-3 and Manitowoc Sanitizer part number 94-0565-3). It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling. Read and understand all labels printed on bottles before use.

CLEANING PROCEDURE

> **⚠ Caution**
> Do not mix Cleaner and Sanitizer solutions together. It is a violation of Federal law to use these solutions in a manner inconsistent with their labeling.

> **⚠ Warning**
> Wear rubber gloves and safety goggles (and/or face shield) when handling ice machine Cleaner or Sanitizer.

Ice machine cleaner is used to remove lime scale and mineral deposits. Ice machine sanitizer disinfects and removes algae and slime.

Step 1 Set the toggle switch to the OFF position after ice falls from the evaporator at the end of a Harvest cycle. Or, set the switch to the OFF position and allow the ice to melt off the evaporator.

> **⚠ Caution**
> Never use anything to force ice from the evaporator. Damage may result.

Step 2 Remove top cover. This will allow easiest access for adding cleaning and sanitizing solutions.

Step 3 Remove all ice from the bin.

Step 4 Place the toggle switch in the CLEAN position. The water will flow through the water dump valve and down the drain. Wait until the water trough refills and water flows over the evaporator, then add the proper amount of ice machine cleaner.

Model	Amount of Cleaner
Q460/Q660	150 ml
Q1060/Q1090	265 ml

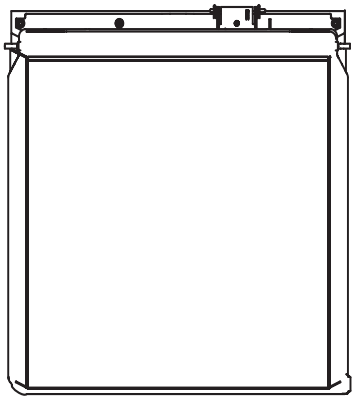
Step 5 Wait until the clean cycle is complete (approximately 30 minutes) then place the toggle switch in the OFF position and disconnect power to the ice machine (and dispenser when used).

> **⚠ Warning**
> Disconnect the electric power to the ice machine at the electric service switch box..

Step 6 Remove parts for cleaning and hand sanitizing.

A. Remove the water curtain

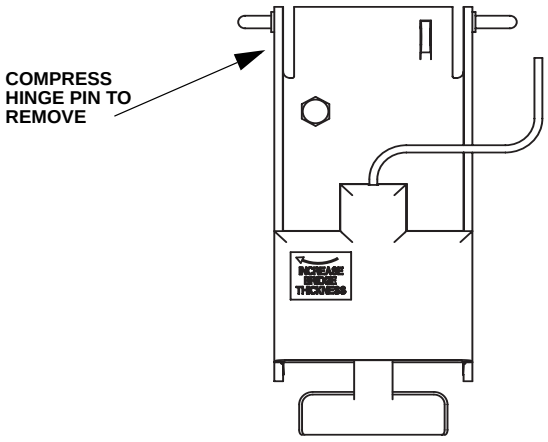
- Gently flex the curtain in the center and remove it from the right side.
- Slide the left pin out.



Water Curtain Removal

B. Remove the ice thickness probe

- Compress the hinge pin on the top of the ice thickness probe.

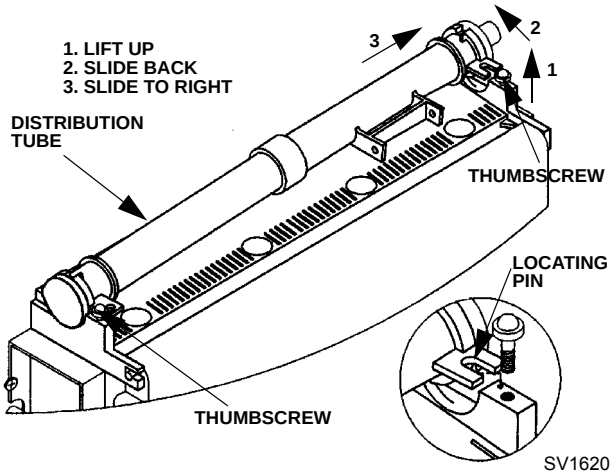


Ice Thickness Probe Removal

- Pivot the ice thickness probe to disengage one pin then the other. The ice thickness probe can be cleaned and sanitized at this point without complete removal. If complete removal is desired, disconnect the ice thickness control wiring from the control board.

C. Remove the water distribution tube

- Disconnect the water hose from the distribution tube.



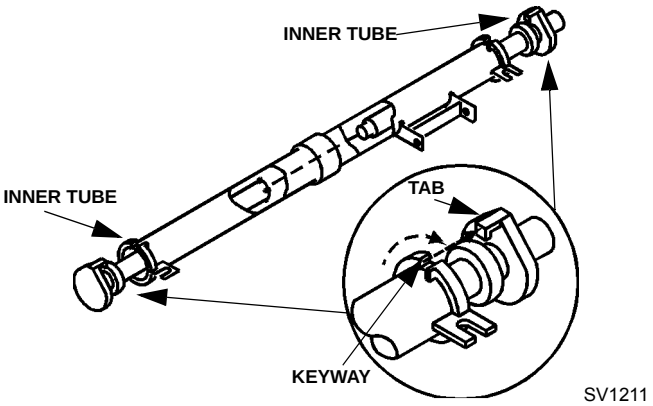
Water Distribution Tube Removal

- Loosen the two thumbscrews which secure the distribution tube.
- Lift the right side of the distribution tube up off the locating pin, then slide it back and to the right.

> **⚠ Caution**
> Do not force this removal. Be sure the locating pin is clear of the hole before sliding the distribution tube out.

Disassemble for cleaning/sanitizing.

- Twist both of the inner tube ends until the tabs line up with the keyways.
- Pull the inner tube ends outward.



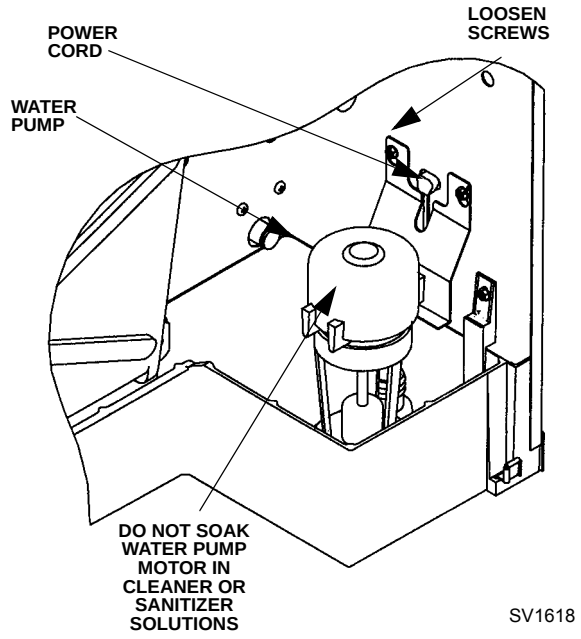
Water Distribution Tube Disassembly

D. Remove the white vinyl water distribution tubing

- Disconnect the hose from the water pump outlet.
- Disconnect the hose from the dump valve (the tubing pressure fits - pull tubing into evaporator compartment).

E. Remove the water pump

- Disconnect the water pump power cord.

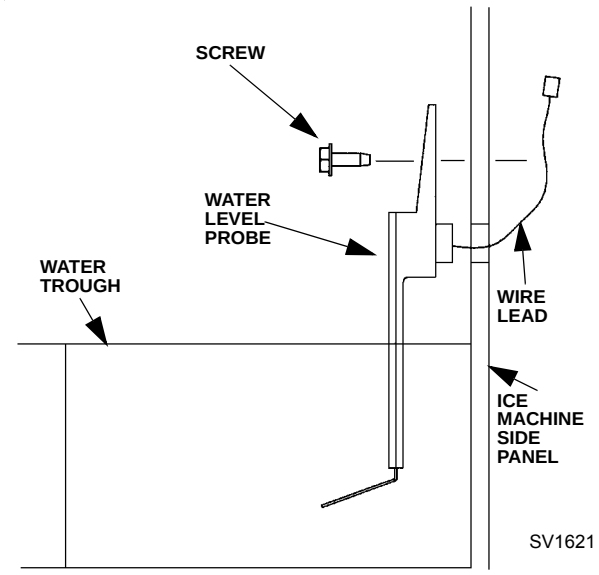


Water Pump Removal

- Loosen the screws securing the pump mounting bracket to the bulkhead.
- Lift the pump and bracket assembly off the screws.

F. Remove the water level probe

- Loosen the screw that holds the water level probe in place. The probe can easily be cleaned and sanitized at this point without proceeding to step 2.
- If complete removal is required, disconnect the wire lead from the control board inside the electrical control box.



Water Level Probe Removal

Step 7 Mix a solution of cleaner and warm water. Depending upon the amount of mineral buildup, a larger quantity of solution may be required. Use the ratio in the table below to mix enough solution to thoroughly clean all parts.

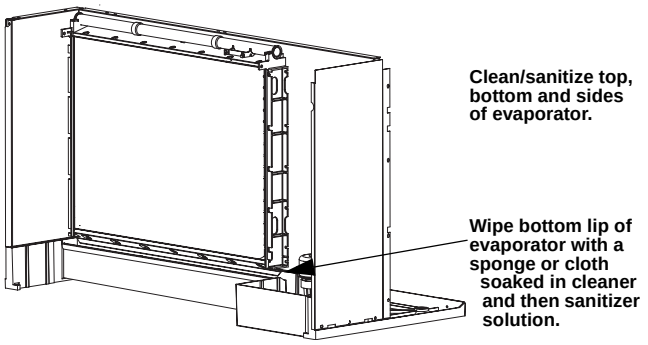
Solution Type	Water	Mixed With
Cleaner	4 l	500 ml cleaner

Step 8 Use 1/2 of the cleaner/water mixture to clean all components. The cleaner solution will foam when it contacts lime scale and mineral deposits; once the foaming stops use a soft-bristle nylon brush, sponge or cloth (NOT a wire brush) to carefully clean the parts. Soak parts for 5 minutes (15 - 20 minutes for heavily scaled parts). Rinse all components with clean water.

Step 9 While components are soaking, use 1/2 of the cleaner/water solution to clean all foodzone surfaces of the ice machine and bin (or dispenser). Use a nylon brush or cloth to thoroughly clean the following ice machine areas:

- Side walls
- Base (bottom of the water trough)
- Interior of the water trough
- Evaporator cells and evaporator plastic parts - including top, bottom, and sides
- Bin or dispenser
- Ice machine top cover

Remove water trough drain plug and rinse all areas thoroughly with clean water. Reinstall water trough drain plug.


Clean/sanitize top, bottom and sides of evaporator.
Wipe bottom lip of evaporator with a sponge or cloth soaked in cleaner and then sanitizer solution.

Step 10 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	23 l	120 ml sanitizer

Step 11 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 12 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin (or dispenser). Use a cloth or sponge to liberally apply the solution. Wipe all surfaces twice to ensure complete coverage with sanitizer solution. When sanitizing, pay particular attention to the following areas:

- Side walls
- Base (bottom of the water trough)
- Interior of water trough
- Evaporator cells and evaporator plastic parts - including top, bottom and sides
- Bin or dispenser
- Ice machine top cover

Do not rinse the sanitized areas. Remove the water trough drain plug and wipe with solution. When the sanitizer solution has drained from the trough, reinstall the water trough drain plug.

Step 13 Replace all removed components.

Step 14 Reapply power to the ice machine and place the toggle switch in the CLEAN position.

Step 15 Wait about two minutes or until water starts to flow over the evaporator. Add the proper amount of Manitowoc Ice Machine Sanitizer to the water trough by pouring between the water curtain and evaporator.

Model	Amount of Sanitizer
Q460 Q660	90 ml
Q1060 Q1090	210 ml

Step 16 The ice machine will stop after the sanitize cycle (approximately 30 minutes). Place the toggle switch in the OFF position and disconnect power to the ice machine.

> **⚠ Warning**
> Disconnect the electric power to the ice machine at the electric service switch box..

Step 17 Repeat step 6 for hand sanitizing.

Step 18 Mix a solution of sanitizer and warm water.

Solution Type	Water	Mixed With
Sanitizer	23 l	120 ml sanitizer

Step 19 Use 1/2 of the sanitizer/water solution to sanitize all removed components. Use a cloth or sponge to liberally apply the solution to all surfaces of the removed parts or soak the removed parts in the sanitizer/water solution. Do not rinse parts after sanitizing.

Step 20 Use 1/2 of the sanitizer/water solution to sanitize all foodzone surfaces of the ice machine and bin (or dispenser). Use a cloth or sponge to liberally apply the solution. When sanitizing, pay particular attention to the following areas:

- Side walls
- Base (bottom of the water trough)
- Interior of water trough
- Evaporator cells and evaporator plastic parts - including top, bottom and sides
- Bin or dispenser
- Ice machine top cover

Do not rinse the sanitized areas. Remove the water trough drain plug and wipe with solution. When the sanitizer solution has drained from the trough, reinstall the water trough drain plug.

Step 21 Install the removed parts, restore power and place the toggle switch in the ICE position.

ADDITIONAL COMPONENT REMOVAL

The following components may be removed for easier access in some installations or they may need to be removed and cleaned to correct an operational problem.

Water Inlet Valve

The water inlet valve normally does not require removal for cleaning. Refer to Section 5 for a list of causes for "No Water Entering Water Trough" or "Water Overflows Water Trough.

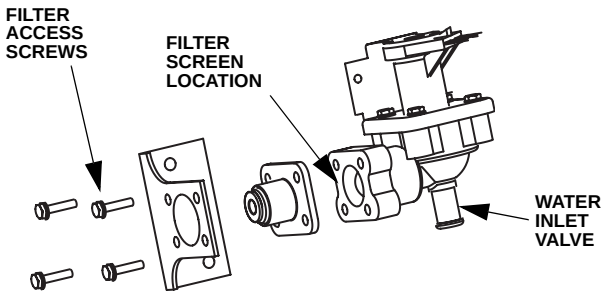
1. When the ice machine is off, the water inlet valve must completely stop water flow into the machine.
2. When the ice machine is on, the water inlet valve must allow the proper water flow through it. Set the toggle switch to ON. Watch for water flow into the ice machine. If the water flow is slow or only trickles into the ice machine, refer to Section 5.

Follow the procedure below to remove the water inlet valve.

⚠ Warning

Disconnect the electric power to the ice machine and dispenser at the electric service switch box and turn off the water supply before proceeding.

1. Remove the 1/4" hex head screws.
2. Remove, clean, and install the filter screen.



Water Dump Valve

The water dump valve normally does not require removal for cleaning. To determine if removal is necessary:

1. Set the toggle switch to ICE.
2. Verify the water trough fills with water at the beginning of the freeze cycle.
3. While the ice machine is in the freeze mode, check the water trough to determine if the dump valve is leaking. If there is no or little water in the water trough (during the freeze cycle) the dump valve is leaking.
   A. If the dump valve is leaking, remove, disassemble and clean it.
   B. If the dump valve is not leaking, do not remove it. Instead, follow the "Ice Machine Cleaning Procedure".

Follow the procedure below to remove the dump valve.

⚠ Warning

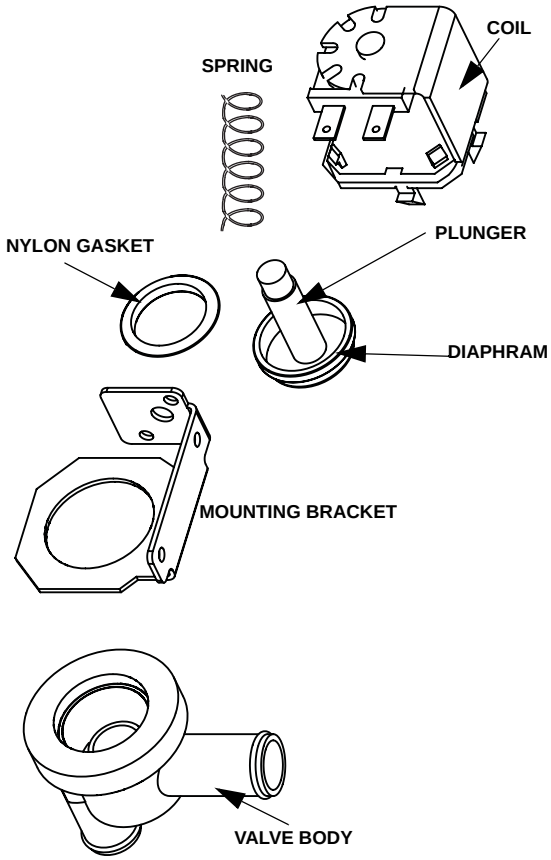
Disconnect the electric power to the ice machine at the electric service switch box and turn off the water supply before proceeding.

1. Leaving the wires attached, twist coil and rotate it counter-clockwise1/4 turn.
2. Lift the coil assembly off the valve body.
3. Remove the spring, plunger, and nylon gasket from the valve body.

NOTE: At this point, the water dump valve can easily be cleaned. If complete removal is desired, continue with step 4.

NOTE: During cleaning, do not stretch or damage the spring.

4. Remove the tubing from the dump valve by twisting the clamps off.
5. Twist the valve body to remove from mounting bracket.



Dump Valve Disassembly

Ice Machine Inspection

Check all water fittings and lines for leaks. Also, make sure the refrigeration tubing is not rubbing or vibrating against other tubing, panels, etc.

Do not put anything (boxes, etc.) on the sides or back of the ice machine. There must be adequate airflow through and around the ice machine to maximize ice production and ensure long component life.

Exterior Cleaning

Clean the area around the ice machine as often as necessary to maintain cleanliness and efficient operation. Use cleaners designed for use with stainless steel products.

Sponge any dust and dirt off the outside of the ice machine with mild soap and water. Wipe dry with a clean, soft cloth.

Heavy stains should be removed with stainless steel wool. Never use plain steel wool or abrasive pads. They will scratch the panels.

Cleaning the Condenser

GENERAL

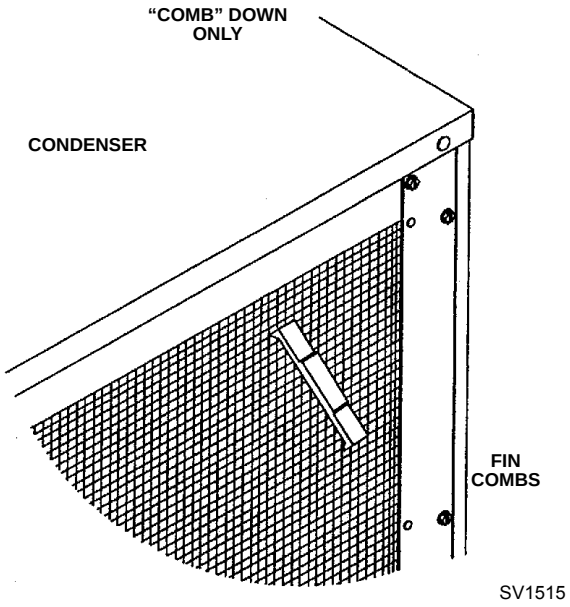
> **⚠ Warning**
> Disconnect electric power to the ice machine head section and the remote condensing unit at the electric service switches before cleaning the condenser.

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces ice production and shortens component life. Clean the condenser at least every six months. Follow the steps below.

> **⚠ Warning**
> The condenser fins are sharp. Use care when cleaning them.

1. The washable aluminum filter on self-contained ice machines is designed to catch dust dirt lint and grease. Clean the filter with a mild soap and water.
2. Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Be careful not to bend the condenser fins.
3. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains:
   A. Blow compressed air through the condenser fins from the inside. Be careful not to bend the fan blades.
   B. Use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.

4. Straighten any bent condenser fins with a fin comb.



Straighten Bent Condenser Fins

5. Carefully wipe off the fan blades and motor with a soft cloth. Do not bend the fan blades. If the fan blades are excessively dirty, wash with warm, soapy water and rinse thoroughly.

> **⚠ Caution**
> If you are cleaning the condenser fan blades with water, cover the fan motor to prevent water damage and disconnect electrical power.

AlphaSan®

The goal of AlphaSan® is to keep the plastic surfaces of an ice machine cleaner, by reducing or delaying the formation of bio-film. The active ingredient in AlphaSan® is the element silver in the form of silver ions (Ag+). AlphaSan® slowly releases silver ions via an ion exchange mechanism. When AlphaSan® is compounded directly into a plastic part, a controlled release of silver ions from the surface is regulated to maintain an effective concentration at or near the surface of the plastic ice machine part. AlphaSan's® unique ability to effectively control the release of silver not only protects against undesired discoloration of the plastic, but also will last the life of the plastic part. Although AlphaSan® helps prevent bio-film build up it does not eliminate the need for periodic cleaning and maintenance. AlphaSan® has no adverse effect on the taste of the ice or beverage.

Removal from Service/Winterization

GENERAL

Special precautions must be taken if the ice machine is to be removed from service for an extended period of time or exposed to ambient temperatures of 0°C or below.

> **⚠ Caution**
> If water is allowed to remain in the ice machine in freezing temperatures, severe damage to some components could result. Damage of this nature is not covered by the warranty.

Follow the applicable procedure below.

SELF-CONTAINED AIR-COOLED ICE MACHINES

1. Disconnect the electric power at the circuit breaker or the electric service switch.
2. Turn off the water supply.
3. Remove the water from the water trough.
4. Disconnect and drain the incoming ice-making water line at the rear of the ice machine.
5. Energize the ice machine and wait one minute for the water inlet valve to open.
6. Blow compressed air in both the incoming water and the drain openings in the rear of the ice machine until no more water comes out of the inlet water lines or the drain.
7. Make sure water is not trapped in any of the water lines, drain lines, distribution tubes, etc.

REMOTE ICE MACHINES

1. Move the ICE/OFF/CLEAN switch to OFF.
2. “Frontseat” (shut off) the receiver service valves. Hang a tag on the switch as a reminder to open the valves before restarting.
3. Perform steps 1-6 under “Self-Contained Air-Cooled Ice Machines.”

Section 5
Before Calling for Service

Checklist

If a problem arises during operation of your ice machine, follow the checklist below before calling service. Routine adjustments and maintenance procedures are not covered by the warranty.

Problem	Possible Cause	To Correct
Ice machine does not operate.	No electrical power to the ice machine and/or condensing unit.	Replace the fuse/reset the breaker/turn on the main switch.
	High pressure cutout tripping.	Clean condenser coil. (See Section 4)
	ICE/OFF/CLEAN toggle switch set improperly.	Move the toggle switch to the ICE position.
	Water curtain stuck open.	Water curtain must be installed and swinging freely. (See Section 4)
	Remote receiver service valve is closed.	Open the valve (See Section 2)
Ice machine stops, and can be restarted by moving the toggle switch to OFF and back to ICE.	Safety limit feature stopping the ice machine.	Refer to “Safety Limit Feature” on the next page.
Ice machine does not release ice or is slow to harvest.	Ice machine is dirty.	Clean and sanitize the ice machine. (See Section 4)
	Ice machine is not level.	Level the ice machine. (See Section 2)
	Low air temperature around ice machine head section.	Air temperature must be at least 1.6°C.
	Fan cycling control does not de-energize condenser fan motor.	Verify pressure is below cut-out setpoint, replace fan cycling control.
Ice machine does not cycle into harvest mode.	The six-minute freeze time lock-in has not expired yet.	Wait for the freeze lock-in to expire.
	Ice thickness probe is dirty.	Clean and sanitize the ice machine. (See Section 4)
	Ice thickness probe is disconnected.	Connect the wire.
	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe. (See Section 3)
	Uneven ice fill (thin at the top of evaporator).	Verify sufficient water level in sump trough. Contact a qualified service company to check refrigeration system.
Ice quality is poor (soft or not clear).	Poor incoming water quality.	Contact a qualified service company to test the quality of the incoming water and make appropriate filter recommendations.
	Water filtration is poor.	Replace the filter.
	Ice machine is dirty.	Clean and sanitize the ice machine. (See Section 4)
	Water dump valve is not working.	Disassemble and clean the water dump valve. (See Section 4)
	Water softener is working improperly (if applicable).	Repair the water softener.

Problem	Possible Cause	To Correct
Ice machine produces shallow or incomplete cubes, or the ice fill pattern on the evaporator is incomplete.	Ice thickness probe is out of adjustment.	Adjust the ice thickness probe. (See Section 4)
	Water trough level is too high or too low.	Check the water level probe for damage. (See Section 3)
	Water inlet valve filter screen is dirty.	Remove the water inlet valve and clean the filter screen. (See Section 4)
	Water filtration is poor.	Replace the filter.
	Hot incoming water.	Connect the ice machine to a cold water supply. (See Section 2)
	Water inlet valve is not working.	Remove the water inlet valve and clean it. (See Section 4)
	Incorrect incoming water pressure.	Water pressure must be 138 - 552 kPA
	Ice machine head section is not level.	Level the ice machine head section. (See Section 2)
Low ice capacity.	Water inlet valve filter screen is dirty.	Remove the water inlet valve and clean the filter screen. (See Section 4)
	Incoming water supply is shut off.	Open the water service valve.
	Water inlet valve stuck open or leaking.	Remove the water inlet valve and clean it. (See Section 4)
	The condenser is dirty.	Clean the condenser. (See Section 4)
	High air temperature around condenser	Air temperature must not exceed 43°C

Safety Limit Feature

In addition to the standard safety controls, such as the high pressure cutout, your Manitowoc ice machine features built-in safety limits which will stop the ice machine if conditions arise which could cause a major component failure.

Before calling for service, re-start the ice machine using the following procedure:

1. Move the ICE/OFF/CLEAN switch to OFF and then back to ICE.
   A. If the safety limit feature has stopped the ice machine, it will restart after a short delay. Proceed to step 2.
   B. If the ice machine does not restart, see “Ice machine does not operate” on the previous page.
2. Allow the ice machine to run to determine if the condition is recurring.
   A. If the ice machine stops again, the condition has recurred. Call for service.
   B. If the ice machine continues to run, the condition has corrected itself. Allow the ice machine to continue running.

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EC DECLARATION OF CONFORMTIY

We hereby declare that our products, ice machines and Multiplex refrigeration equipment comply with all the essential requirements of the listed EC - directives.

Manufacturer:

Manitowoc Ice, Inc.
2110 S. 26th Street, P.O. Box 1720
Manitowoc, Wisconsin 54221-1720 USA

European Distributor:

Representative of Manitowoc Ice, Inc.:

Engineering Manager. (Printed name)

Signature

Representative of European Distributor:

Model and Serial No.

Applied EC Directives:

Low Voltage 73/23/EEC
EMC 89/336/EEC
Pressure Equipment 97/23/EC

Applied Standards:

EN60335-1 Safety of household and similar electrical appliances
EN60335-2-24 Particular requirements refrigerators, food freezers and ice makers

EN55014 Electrical Motor Operated Appliances (Emissions)
EN55104 Electro Magnetic Compatability (Immunity)
EN378 -1 to -4 Refrigeration Plants

CE **

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